

Application No. 10/064,791
Docket No. 13DV-13975
Amendment dated August 4, 2005
Reply to Office Action of May 5, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-25 (canceled)

Claim ~~28~~¹ (currently amended): A thermal barrier coating on a surface of a component, the thermal barrier coating comprising a thermal-insulating material whose microstructure comprises columnar grains, the thermal insulating material containing ~~in which is contained~~ clusters of elemental carbon and a carbon-containing gas that is insoluble in the thermal-insulating material, the insoluble gas and at least some of the clusters being entrapped within pores that have been closed by sintering and are within grains and at and between grain boundaries of the thermal-insulating material, the entrapped clusters and the insoluble gas being present substantially throughout the thermal-insulating material in an amount sufficient to thermally stabilize the microstructure of the thermal-insulating material.

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Claim ~~27~~ (previously presented): A thermal barrier coating according to claim ~~26~~, further comprising clusters of carbides entrapped within some of the pores that were closed by sintering.

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Claim ~~28~~ (currently amended): A thermal barrier coating according to claim ~~26~~, wherein at least some of the pores closed by sintering entrap sulfur dioxide gas and/or nitrogen gas. ~~gas~~

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Claim ~~29~~ (previously presented): A thermal barrier coating according to claim ~~26~~, wherein the insoluble gas is at least one gas chosen from the group consisting of carbon monoxide and carbon dioxide.

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Claim ~~30~~ (previously presented): A thermal barrier coating according to claim 26, wherein at least some of the pores closed by sintering entrap at least one gas chosen from the group consisting of sulfur dioxide, nitrogen and argon.

Claim 31 (canceled)

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Claim ~~32~~ (original): A thermal barrier coating according to claim ~~26~~,

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wherein the thermal-insulating material is predominantly yttria-stabilized zirconia.

Claim 33 (canceled)

Claim ~~34~~⁷ (previously presented): A thermal barrier coating on a surface of a superalloy component, the thermal barrier coating comprising:
a bond coat on the component; and
a thermal-insulating material having a columnar microstructure with pores and sub-grain interfaces within, at and between grain boundaries of the microstructure, at least some of the pores throughout the thermal-insulating material being closed by sintering to entrap clusters of elemental carbon and a carbon-containing gas that inhibit further sintering, grain coarsening and pore redistribution within the thermal-insulating material and thereby thermally stabilize the microstructure.

Claim ~~35~~⁸ (previously presented): A thermal barrier coating according to claim ~~34~~⁷, wherein the thermal-insulating material consists of yttria-stabilized zirconia.

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Claim ~~36~~⁹ (previously presented): A thermal barrier coating according
to claim ~~34~~⁷, wherein at least some of the pores closed by sintering entrap
clusters of carbides.

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Claim ~~37~~¹⁰ (previously presented): A thermal barrier coating according
to claim ~~36~~⁹, wherein at least some of the pores closed by sintering entrap
carbon dioxide or carbon monoxide.

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Claim ~~38~~¹¹ (previously presented): A thermal barrier coating according
to claim ~~34~~⁷, wherein at least some of the pores closed by sintering entrap sulfur
dioxide gas or nitrogen gas.

Claims 39-40 (canceled)